

Consultation response form

Your response

Note: question numbers are aligned to relevant sections in the call for inputs document. As such, there is no question 1.

<p>Question 2.1: What are your planned timelines for commercial availability of network equipment and devices for the 26 GHz band? When will equipment for testing and trials be available? Please specify the specific mmWave tuning ranges supported and their timing.</p>	<p>Confidential? – Y/N</p> <p>No comment.</p>
<p>Question 2.2: Given the 3GPP studies into NR-based operations in licence-exempt spectrum, when (if ever) do you expect to support licence exempt operation and/or coordinated sharing in the 26 GHz band in your products?</p>	<p>Confidential? – Y/N</p> <p>No comment.</p>
<p>Question 2.3: When do you expect to support standalone New Radio in the 26 GHz band in your products?</p>	<p>Confidential? – Y/N</p> <p>No comment.</p>
<p>Question 3.1: Are there any other aspects related to the existing use of 26 GHz not covered in this CFI that you believe need to be considered?</p>	<p>Confidential? – N</p> <p>26.5 GHz - 27.5 GHz is an important band for NATO with scope in the future for more intense usage. MOD use at present is relatively low and primarily localised on MOD sites but is anticipated to grow as technology ecosystems do the same. MOD's future capability requirements and access to the 26.5 GHz - 27.5 GHz band (as well as 40.5 – 43.5 GHz and 66 – 71 GHz) should be manageable within sharing of this spectrum with civil 5G services provided any future civil authorisation in the bands highlighted are demand driven and regularly monitored.</p> <p>There will be an increasing MOD use of higher frequencies in the future to enable high-speed broadband connectivity to remote locations and moving platforms, particularly ships and aircraft. Many aircraft, including UAVs, operate at long range and require increasing datalink capacity. Mobile high-speed broadband satellite connectivity in the EHF bands (30 - 300 GHz) would provide MOD with the required</p>

	<p>bandwidth with reduced susceptibility to interception and jamming. Sufficient and assured access to spectrum (particularly at higher frequencies) is therefore required to maximise and sustain military effectiveness across Defence due to the expected volume of data that will continue to increase due to the entry into service of data-hungry capabilities such as the F-35 and the Queen Elizabeth aircraft carriers (as well as continuing to support the growing demand of existing use provided by satellite communications). It is essential that MOD has access to spectrum that will enable the military to operate unhindered in future operations across the globe. This will be guided by MOD user requirements and a margin of uncertainty will be applied to protect against unforeseen circumstances. Reliable access to spectrum where interests are balanced by all parties is critical and MOD welcome the opportunity to work closely with Ofcom to ensure the right outcomes are reached.</p>
<p>Question 3.2: What options for the existing services in the 26 GHz band do you believe need to be considered to allow for the introduction of new 5G services? Please give as detailed a response as possible along with all relevant information and explain how you would see any potential option you provide working in practice.</p>	<p>Confidential? – N</p> <p>The MOD would need to agree upon a suitable metric to define areas which allow 5G to provide the services needed by citizens and consumers without limiting MOD’s future flexibility in the 26 GHz band any more than necessary. There is also MOD use adjacent to the 40.5 GHz band boundary and 43.5 GHz - 45.5 GHz is an essential band for NATO.</p>
<p>Question 3.3: Should a moratorium be placed on issuing new licences in the 26 GHz band for existing services? E.g. to ensure that the 26 GHz band is not unnecessarily encumbered prior to the development of a new authorisation / licensing approach for 5G services?</p>	<p>Confidential? – N</p> <p>MOD believes NR 5G services would provide the most efficient use of spectrum if sharing with incumbents and demonstrating technical flexibility. On this assumption, MOD believes there is not a requirement to place a moratorium on this band.</p>
<p>Question 4.1: What service would be delivered and to which consumer and/or organisations?</p>	<p>Confidential? – Y/N</p> <p>No comment.</p>
<p>Question 4.2: Where in the UK would the 26 GHz spectrum be used to deliver services? For example, will deployments be focussed on: a) Areas of existing high mobile broadband demand?</p>	<p>Confidential? – Y/N</p> <p>No comment.</p>

<p>b) Rural areas? c) Rail and road corridors? d) Specific types of enterprise or industrial sites? e) Indoors or outdoors? f) Specific nations or regions of the UK?</p>	
<p>Question 4.3: Where 5G cells are deployed, are they expected to be individual cells or as clusters of cells required to give wider areas of contiguous coverage? What would be the area of a typical contiguous coverage cell cluster?</p>	<p>Confidential? – Y/N</p> <p>No comment.</p>
<p>Question 4.4: What capacity and bandwidth (i.e. Channel Bandwidth in MHz) would be required at each cell to meet initial capacity requirements? How will this change over time?</p>	<p>Confidential? – Y/N</p> <p>No comment.</p>
<p>Question 4.5: What quality of service is required? How sensitive is the service being offered to variations in radio interference from other operator’s 5G cells and other spectrum users?</p>	<p>Confidential? – Y/N</p> <p>No comment.</p>
<p>Question 4.6: Will end users be fixed or mobile?</p>	<p>Confidential? – Y/N</p> <p>No comment.</p>
<p>Question 4.7: What are the characteristics of 5G at 26 GHz which make this band particularly suited to the service you plan to deploy? What other spectrum bands could be used as an alternative, or in preference to, the 26 GHz band? To what extent could carrier aggregation and other techniques reduce your reliance on 26 GHz?</p>	<p>Confidential? – Y/N</p> <p>No comment.</p>
<p>Question 5.1: Should Ofcom consider licencing options other than the 3 examples set out above (licence exempt, shared coordinated and area defined) for the 26 GHz band? If so, what other options do you consider should be included?</p>	<p>Confidential? – N</p> <p>MOD are working on finding innovative sharing approaches which could benefit the Ofcom thinking on authorisation approaches within the 26 GHz band. In the face of the continued shortage of spectrum, industry is looking at technology solutions to avoiding network congestion. Mobile Network Operators are investigating the use of small cells to boost capacity in urban areas or looking to offload more mobile data traffic to Wi-Fi, especially in the locations where demand is greatest. Recent developments in software defined radios, adaptive antennas and carrier aggregation seem to demonstrate that frequency-agile</p>

	<p>systems that can operate in any available spectrum band may soon be technically possible. MOD hopes to incentivise industry and draw out innovation in order to encourage collaboration and believe there is an opportunity for engagement with Ofcom (and external stakeholders) to identify military requirements alongside the current technology landscape in order to fulfil greater spectrum sharing and efficiency in the future. As this engagement is currently in its early stages further detail to the following questions should become available as this work progresses.</p>
<p>Question 5.2: What methodologies could be used to pre-define 'high demand areas' for area defined licences?</p>	<p>Confidential? – Y/N</p> <p>No comment.</p>
<p>Question 5.3: What mechanism could be used to coordinate cell deployments by different operators in shared spectrum?</p>	<p>Confidential? – Y/N</p> <p>No comment.</p>
<p>Question 5.4: What methodologies could be used for determining the proportion of spectrum to allocate using area defined licences and coordinated deployment?</p>	<p>Confidential? – Y/N</p> <p>No comment.</p>
<p>Question 5.5: Do you agree that the 26 GHz band should be released progressively? What risks do you envisage with such an approach and how can these be best mitigated?</p>	<p>Confidential? – N</p> <p>The MOD believes that the 26 GHz band does not need to be cleared of incumbent uses since at higher frequencies there is generally more scope for sharing due to shorter propagation distances (although this is application dependent), reduced beamwidths and the development of new techniques in spectrum sharing. Provided sharing with incumbent services is shown to be possible, MOD do not object to the introduction of new services. However, MOD would seek assurance that existing use would not be impaired by future 5G mobile deployments. MOD would like the opportunity to discuss in detail with Ofcom the certainty of maintaining sufficient protection of current and future services in the 26 GHz, 40.5 GHz – 43.5 GHz and 66 GHz – 71 GHz bands.</p>